

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and in light of the following discussion, is respectfully requested.

Claims 11, 12, 14-16, and 19-25 are pending. By the present amendment, Claims 11, 14, and 16 are amended. Support for the present amendment can be found in the original specification, for example, at page 3, lines 9-16, at page 9, lines 16-35, and in Figures 1-4. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claims 11, 12, 16, 21, and 23 were rejected under 35 U.S.C. § 103(a) as unpatentable over Nishizaki et al. (U.S. Publication No. 2004/0140148, hereinafter “Nishizaki”); and Claims 14, 15, 19, 20, 22, 24, and 25 were objected to, but indicated as including allowable subject matter.

Initially, Applicants would like to thank Examiner Behncke for taking the time to discuss the present application with Applicants’ representative, Colin Harris, on April 18, 2011. During this discussion, Applicants’ representative explained the claimed invention and some potential claim amendments that further define the response time. Examiner Behncke provided suggestions regarding further clarifying that the response time includes a delay. Accordingly, the present amendment was prepared based on this discussion and is hereby submitted for formal consideration.

Applicants acknowledge with appreciation the indication of allowable subject matter in dependent Claims 14, 15, 19, 20, 22, 24, and 25. In response, Claim 14 is hereby rewritten in independent form to include the subject matter of Claims 11 and 12. Additionally, as Applicants believe that independent Claims 11 and 16 also contain allowable subject matter, the remaining allowable claims are maintained in dependent form for the present time.

Turning now to the rejection under 35 U.S.C. § 103(a), Applicants respectfully request reconsideration of this rejection and traverse this rejection, as discussed below.

Claim 11 recites a method of assisting steering of steered wheels of a vehicle. This method comprises determining a response time between an action of a driver on the steering wheel and a commencement of steering of the steered wheels. The response time includes a predetermined delay such that, when the driver turns the steering wheel, the wheels of the vehicle are not steered until the delay is completed. An exemplary embodiment of this delay is represented as the total of t_1 and t_2 in Figure 3.

Additionally, when the angular speed is greater than the threshold speed and an angular acceleration is greater than the threshold acceleration, the method comprises applying a phase advance between the steering wheel and a rack element so as to decrease the response time of the vehicle. In the exemplary embodiment of Figure 3, the portion of the delay represented by t_1 is eliminated so that the wheels begin turning more quickly in response to an input from the driver.¹

It is respectfully submitted that the cited reference does not disclose or suggest every feature recited in independent Claim 11.

Nishizaki describes a vehicle including a steering wheel 100, a rack and pinion mechanism 104, and a steering shaft 102 fixed to the steering wheel 100 and rack and pinion mechanism 104. The vehicle of Nishizaki also includes a motor 6 that is driven by an ECU 5 to assist the steering of the steering wheel 100.² Additionally, Nishizaki describes applying a phase advance/delay such that the motor 6 does not provide any assist when the torque input to the steering wheel 100 is in a range near zero. Thus, Nishizaki is directed to assisting the driver with steering the vehicle when the driver is applying a predetermined amount of torque to the steering wheel.

¹ See the original specification, for example, at page 4, lines 27-32.

² See Nishizaki, at paragraph [0036] and in Figure 1.

However, it is respectfully submitted that Nishizaki does not disclose or suggest “determining a response time between an action of a driver on the steering wheel and a commencement of steering of the steered wheels, the response time including a predetermined delay” such that “when the angular speed is greater than the threshold speed and the angular acceleration is greater than the threshold acceleration, applying a phase advance between the steering wheel and a rack element to eliminate a portion of the predetermined delay so as to decrease the response time of the vehicle,” as recited in amended Claim 11.

Instead, as discussed above, the phase advance/delay of Nishizaki does not eliminate a predetermined delay between an action of a driver on the steering wheel and a commencement of steering of the steered wheels. On the contrary, Nishizaki expressly describes not assisting in the steering until the amount of torque that the driver inputs to the steering wheel surpasses a predetermined limit. Thus, at the commencement of the steering (i.e., when the driver first inputs torque to the steering wheel), there is no assist by the motor 6 and the wheels are not turned any sooner than a predetermined delay.

Additionally, any advance or delay imposed by the phase compensating unit 123 of Nishizaki is for avoiding a dead zone near a zero torque input. Thus, the advance or delay described in Nishizaki does not reduce a delay between an action on the steering wheel 100 and commencement of wheels steered by the rack and pinion mechanism 104.

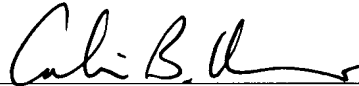
Consequently, it is respectfully submitted that Nishizaki does not disclose or suggest every feature recited in independent Claim 11. Thus, it is respectfully requested that the rejection of Claim 11, and all claims dependent thereon, as unpatentable over Nishizaki be withdrawn.

Claim 16, while directed to an alternative embodiment, recites features similar to those discussed above with respect to Claim 11. Accordingly, it is also respectfully requested that the rejection of Claim 16 as unpatentable over Nishizaki be withdrawn.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal allowance. A Notice of Allowance is earnestly solicited.

Respectfully submitted,

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